Tisa, Kimberly

From: Battaglia, Frank
Sent: Tuesday, March 27, 2018 12:31 PM
To: Crawford, Jeffrey (DEM); Tisa, Kimberly
Cc: kelly.owens.dem.ri.gov
Subject: RE: [EXTERNAL] : RE: Corrective Measures Implementation Plan & Drawings

It is unless Clean Harbors/Safety Kleen buys the property and uses it for additional parking near where the warehouse is located.

Frank

From: Crawford, Jeffrey (DEM) [mailto:jeff.crawford@dem.ri.gov]
Sent: Tuesday, March 27, 2018 11:59 AM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Cc: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Corrective Measures Implementation Plan & Drawings

I thought 1102 was to remain under their oversight.

From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Tuesday, March 27, 2018 9:38 AM
To: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov>
Subject: [EXTERNAL] : RE: Corrective Measures Implementation Plan & Drawings

Kim is correct. BASF corporate does not want to specify a particular use at this time given all the possible legal issues and potential buyers of the property.

Frank

From: Tisa, Kimberly
Sent: Tuesday, March 27, 2018 9:02 AM
To: Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Cc: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Subject: RE: Corrective Measures Implementation Plan & Drawings

I think this was recently added as an example of what future use could be. I believe Frank had some conversation with Joe on trying to keep the end use somewhat open given that the end use was not clearly established.

Frank, please chime in on this.

Kimberly N. Tisa, PCB Coordinator
USEPA
5 Post Office Square, Suite 100
Boston, MA 02109-3912

617.918.1527 (phone)

617.918.0527 (fax)
Tisa.Kimberly@epa.gov

From: Crawford, Jeffrey (DEM) [mailto:jeff.crawford@dem.ri.gov]
Sent: Tuesday, March 27, 2018 8:52 AM
To: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Cc: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Subject: Corrective Measures Implementation Plan & Drawings

I was just scanning through the drawings provided for Lot 1102 and the final Implementation Plan. Curious, when did the Dog Park theme and trails get worked into the final cap? Not that it is a bad thing, but this may require more long-term maintenance and upkeep on someone's part.

Tisa, Kimberly

From: Battaglia, Frank
Sent: Tuesday, March 20, 2018 4:47 PM
To: Tisa, Kimberly
Subject: FW: CMI reuse edits
Attachments: BASF Cranston Lot 1102 CMI_REVISED REUSE edits.docx

FYI, these edits should not change the clean-up.

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, March 20, 2018 1:27 PM
To: Battaglia, Frank <battaglia.frank@epa.gov>
Cc: Rick Kowalski <rkowalski@aeiconsultants.com>
Subject: CMI reuse edits

Frank
Based on my phone message, BASF needs to be generic on future use of this river lot. While we intend to complete the cap with a vegetative support layer including elements of native upland habitat (as is in the CMI), we do not have definitive plans on reuse. E.g., it may include such uses as:

- BASF retains w/o public access
- BASF retains w/ public access
- City retains with open space and dog park.
- Safety Kleen retains and uses upper corner (outside of the 200' river setback) for parking, the remainder remains as open space.

Attached is the CMI text with 5 yellow highlight changes that need to be made.

It is important to make these edits because we cannot promise things we cannot deliver.

Let's discuss, and assuming you agree Rick will send out another electronic version and send out the 5 replacement pages.

Joe.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail: joseph.guarnaccia@basf.com
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

Tisa, Kimberly

From: Rick Kowalski <rkowalski@aeiconsultants.com>
Sent: Thursday, March 08, 2018 2:50 PM
To: Battaglia, Frank; Tisa, Kimberly
Cc: Joseph F Guarnaccia; Stephen Graham; Crawford, Jeffrey (DEM)
Subject: RE: Ciba-Geigy Cranston RI CMI Work Plan - SOP for PCB analyses

Thank you for your approval. I included your edit in the final version. We agree that 9 samples may not be enough (that's why we said minimum of 9). The revised version of the SOP will be included in Attachment 3, along with the Comparability Study. (There are now 4 Attachments to the CMI. I added these to avoid having to renumber all the Appendices).

I can now tell you that we will submit the revised CMI Work Plan and Responses to Comments within the next few days. **Do you want the red-lined strike-out versions in electronic form, hard copy, or both?**

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531
www.aeiconsultants.com

From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Tuesday, February 27, 2018 3:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: Ciba-Geigy Cranston RI CMI Work Plan - SOP for PCB analyses

Rick,

EPA approves BASF's plan to use the Dexsil method for PCB analysis during the Cranston site remediation as described in the attached word document. Please be aware that there was one necessary change in the word document that is redlined in the attached document. Please include the corrected version in the amended CMI work plan.

EPA will review the next lab data supported submittal to revise the Dexsil multiplication factor but please be advised that 9 samples, as proposed in the attached SOP, may not be enough samples given the variability in the data that was submitted in the previous request.

Also, please advise as to when you expect to submit the amended CMI Work Plan and the response to EPA comments document?

Thanks.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, February 23, 2018 11:15 AM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>
Subject: Ciba-Geigy Cranston RI CMI Work Plan - SOP for PCB analyses

Frank and Kim: BASF has decided to use the Dexsil method for PCB analysis during the site remediation. As requested, attached is a Standard Operation Procedure (SOP) for use of this instrument with lab soxhlet method verification on this project. This document:

- Defines the excavation-related sampling SOP.
- Specifies the use of the Dexsil data with a 2x multiplication factor initially with a possible lab data-supported reduction of the multiplication factor, following EPA approval.

Please review and let us know if you have any comments. I included a word version for you to make any changes necessary. Following approval, this SOP will be included in the Appendix of the final CMI Work Plan. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531
www.aeiconsultants.com

Tisa, Kimberly

From: Rick Kowalski <rkowalski@aeiconsultants.com>
Sent: Friday, February 23, 2018 11:15 AM
To: Battaglia, Frank; Tisa, Kimberly
Cc: Joseph F Guarnaccia; Stephen Graham
Subject: Ciba-Geigy Cranston RI CMI Work Plan - SOP for PCB analyses
Attachments: 363655_BASF Cranston RI Lot 1102 Dexsil Use SOP 02-23-2018.docx; 363655_BASF Cranston RI Lot 1102 Dexsil Use SOP 02-23-2018.pdf

Frank and Kim: BASF has decided to use the Dexsil method for PCB analysis during the site remediation. As requested, attached is a Standard Operation Procedure (SOP) for use of this instrument with lab soxhlet method verification on this project. This document:

- Defines the excavation-related sampling SOP.
- Specifies the use of the Dexsil data with a 2x multiplication factor initially with a possible lab data-supported reduction of the multiplication factor, following EPA approval.

Please review and let us know if you have any comments. I included a word version for you to make any changes necessary. Following approval, this SOP will be included in the Appendix of the final CMI Work Plan. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531
www.aeiconsultants.com

MEMORANDUM

TO: Frank Battaglia and Kim Tisa, EPA

FROM: AEI Consultants

SUBJECT: BASF Corporation
Former Ciba-Geigy Facility
Lot 1102, 180 Mill Street, Cranston, Rhode Island
PCB Analysis Using Dexsil Method Standard Operating Procedure

DATE: February 27, 2018

INTRODUCTION AND PURPOSE

AEI Consultants (AEI) has prepared this technical memorandum to present the Standard Operating Procedure (SOP) for the use of the PCB screening tool, Dexsil L2000DX PCB/Chloride analyzer, for the upcoming remedial effort at the above referenced Site. The goal is to uniformly use the Dexsil analyzer as a quantification method, in conjunction with a subset of traditional laboratory analysis via EPA Method 8082A/3450C Soxhlet Extraction, to quantify the in-situ PCB concentrations and demonstrate compliance with TSCA (40 CFR 761.61(c)) and RIDEM Remediation Regulation (DEM-DSR-01-93) post-excavation cleanup standards. This SOP incorporates the results of a PCB Analysis Comparability Study previously submitted to EPA on December 5, 2017 with subsequent comments by EPA.

COMPARABILITY STUDY RESULTS/RECOMMENDATIONS

As detailed in Section 6.2 of the Sampling and Analysis Plan (SAP), submitted to EPA and RIDEM as Appendix F of the Corrective Measures Implementation Work Plan on September 8, 2017, AEI collected representative soil samples from Lot 1102 and from a soil stockpile as part of a PCB Data Comparability Study. The objective of the study was to design the protocol for post-excavation verification sampling analysis using a combination of field-screening using an EPA-approved field extraction and analysis technology (EPA Method 9078, called Dexsil herein) and laboratory analytical data. The SOP considers the Site's two remedial action objective metrics:

1. The 25 mg/kg metric where site soils will be uniformly remediated to below 25 mg/kg.
2. The 10 mg/kg metric; soils remaining above this metric and subject to potential infiltration from precipitation must be covered with an impermeable HDPE liner, and the Site's post-excavation 95% Upper Confidence Level (UCL) PCB concentration must be < 10 mg/kg.

The Dexsil results were evaluated against laboratory data to determine how the Dexsil data should be used in making field decisions. The evaluation included a regression analysis and calculation of the relative percent difference (RPD) for each sample. AEI determined whether the use of a

multiplier for the field screening results would be necessary to ensure that false negatives are eliminated (i.e., soils that actually contain either >25 mg/kg or >10 mg/kg are not identified as either <25 mg/kg or <10 mg/kg, respectively).

The comparison study showed the following:

1. While on average the Dexsil overpredicted the actual concentrations, the screening results were susceptible to underprediction within the 3 mg/kg to 30 mg/kg range.
2. The correlation for concentrations greater than 10 mg/kg was excellent (R2 = 0.99), however, for concentrations ≤ 20 mg/kg the correlation was degraded.
3. The correlation for concentrations less than 10 mg/kg was marginal (R2 = 0.22), however, the Dexsil was generally biased high (8 of 11 results).

Given these observations, the conclusion is that the Dexsil analyzer can be used for post-excavation verification sampling analysis with the following condition intended to eliminate possible false negatives of the 10 mg/kg and 25 mg/kg metrics:

- Use a conservative multiplier of 2.0 for the Dexsil data, ie., a reading of 5 mg/kg on the Dexsil will be converted to 10 mg/kg.

In accordance with the Field Sampling Plan in the CMI (Appendix F) for every fifth Dexsil sample taken (i.e., 20% frequency), a duplicate sample will be submitted for laboratory analysis using EPA Method 8082/3540.

PROPOSED USE OF THE DEXSIL METHOD

AEI proposes to use the Dexsil analyzer for determining PCB concentrations in soils during the excavation process and post-excavation to confirm that the site-specific PCB Media Protection Standard has been achieved. All Dexsil results less than 30 mg/kg will initially be multiplied by a factor of 2.0. As described below. during the initial phase of project implementation, AEI will collect data to refine the scale of the factor and adjust it as appropriate with approval by the EPA.

The Dexsil analyzer will not be used to characterize soils for disposal characterization purposes. The Dexsil analyzer will also not be used to determine post-excavation PCB concentrations within the Floodway where <1 mg/kg must be achieved. However, it may be used during the excavation process in the Floodway to determine when it is appropriate to collect post-excavation samples for laboratory analyses.

COMPARABILITY STUDY ADDENDUM

AEI will complete an additional study to supplement the existing data, specifically within the 3 to 30 mg/kg range, to refine the scale of the multiplier. This will be accomplished during the completion of the first excavation area on the Site. AEI will collect duplicate samples for laboratory analysis from each location with a result of 30 mg/kg or less (without the application of a multiplier). A minimum of 9 duplicate samples will be collected. AEI will determine the

relative percent difference (positive or negative) for each sample and recalculate a correlation coefficient using all the data collected during both studies. Based on the results, AEI will present recommendations for altering the multiplier, as appropriate, for EPA approval.

MEMORANDUM

TO: Frank Battaglia and Kim Tisa, EPA

FROM: AEI Consultants

SUBJECT: BASF Corporation
Former Ciba-Geigy Facility
Lot 1102, 180 Mill Street, Cranston, Rhode Island
PCB Analysis Using Dexsil Method Standard Operating Procedure

DATE: February 23, 2018

INTRODUCTION AND PURPOSE

AEI Consultants (AEI) has prepared this technical memorandum to present the Standard Operating Procedure (SOP) for the use of the PCB screening tool, Dexsil L2000DX PCB/Chloride analyzer, for the upcoming remedial effort at the above referenced Site. The goal is to uniformly use the Dexsil analyzer as a quantification method, in conjunction with a subset of traditional laboratory analysis via EPA Method 8082A/3450C Soxhlet Extraction, to quantify the in-situ PCB concentrations and demonstrate compliance with TSCA (40 CFR 761.61(c)) and RIDEM Remediation Regulation (DEM-DSR-01-93) post-excavation cleanup standards. This SOP incorporates the results of a PCB Analysis Comparability Study previously submitted to EPA on December 5, 2017 with subsequent comments by EPA.

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1. The 25 mg/kg metric where site soils will be uniformly remediated to below 25 mg/kg.
2. The 10 mg/kg metric; soils remaining above this metric and subject to potential infiltration from precipitation must be covered with an impermeable HDPE liner, and the Site's post-excavation 95% Upper Confidence Level (UCL) PCB concentration must be < 10 mg/kg.

The Dexsil results were evaluated against laboratory data to determine how the Dexsil data should be used in making field decisions. The evaluation included a regression analysis and calculation of the relative percent difference (RPD) for each sample. AEI determined whether the use of a

multiplier for the field screening results would be necessary to ensure that false negatives are eliminated (i.e., soils that actually contain either >25 mg/kg or >10 mg/kg are not identified as either <25 mg/kg or <10 mg/kg, respectively).

The comparison study showed the following:

1. While on average the Dexsil overpredicted the actual concentrations, the screening results were susceptible to underprediction within the 3 mg/kg to 30 mg/kg range.
2. The correlation for concentrations greater than 10 mg/kg was excellent (R2 = 0.99), however, for concentrations ≤ 20 mg/kg the correlation was degraded.
3. The correlation for concentrations less than 10 mg/kg was marginal (R2 = 0.22), however, the Dexsil was generally biased high (8 of 11 results).

Given these observations, the conclusion is that the Dexsil analyzer can be used for post-excavation verification sampling analysis with the following condition intended to eliminate possible false negatives of the 10 mg/kg and 25 mg/kg metrics:

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In accordance with the Field Sampling Plan in the CMI (Appendix F) for every fifth Dexsil sample taken (i.e., 20% frequency), a duplicate sample will be submitted for laboratory analysis using EPA Method 8082/3540.

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The Dexsil analyzer will not be used to characterize soils for disposal characterization purposes. The Dexsil analyzer will also not be used to determine post-excavation PCB concentrations within the Floodway where <1 mg/kg must be achieved. However, it may be used during the excavation process in the Floodway to determine when it is appropriate to collect post-excavation samples for laboratory analyses.

COMPARABILITY STUDY ADDENDUM

AEI will complete an additional study to supplement the existing data, specifically within the 3 to 30 mg/kg range, to refine the scale of the multiplier. This will be accomplished during the completion of the first excavation area on the Site. AEI will collect duplicate samples for laboratory analysis from each location with a result of 30 mg/kg or less (without the application of a multiplier). A minimum of 9 duplicate samples will be collected. AEI will determine the

relative percent difference (positive or negative) for each sample and recalculate a correlation coefficient using all the data collected during both studies. Based on the results, AEI will present recommendations for altering the multiplier, as appropriate, for EPA approval.

Tisa, Kimberly

From: Battaglia, Frank
Sent: Thursday, January 25, 2018 4:16 PM
To: Joseph F Guarnaccia; Rick Kowalski; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham; Battaglia, Frank
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, we meant a 100% increase in the Dexsil results and I agree that Dexsil * 2 provides little value. The reason is that the data set was too wide in terms of sample results and the Dexsil results did not correlate well with the fixed analytical results. The data set should have focused more on the target cleanup number. A larger data set around the clean-up number would be needed in order to evaluate the accuracy of the Dexsil method for this site.

EPAs concern is that you will under estimate the PCB concentrations remaining after clean-up and therefore the risk could be much higher and the target clean-up number would be exceeded.

In the meantime, once EPA receives all the response documents we can move forward with the PCB approval based on using a fixed analytical lab for confirmatory sampling results. If you provide a larger, more focused sample set using the Dexsil method, we would review it and revisit/amend our approval if warranted. We would like to move forward with an approval as soon as possible so as to begin remediation once the weather cooperates. Thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Wednesday, January 24, 2018 10:09 PM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Rick Kowalski <rkowalski@aeiconsultants.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank,
Please clarify your comment:

"EPA suggested a 100% increase in screening results would be needed in order to use the Dexsil method."

Do you mean 100% increase of our proposed FOS of 1.25 = 1.5, or 100% increase of the Dexsil result = 2.0?

Our proposed remedy provides belt-and-suspenders risk management. BASF does not understand why more FOS is needed. At Dexsil * 2, I do not know what value screening provides. What is EPA's concern from a risk-management point of view?

Regards
Joe

Joseph Guarnaccia Ph. D.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail: joseph.guarnaccia@basf.com
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Tuesday, January 23, 2018 6:05 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, after our first conference call on the CMI in November, we discussed many EPA comments. Field screening was comment # 20 and EPA thought the field screening results that were submitted were not accurate. EPA suggested a 100% increase in screening results would be needed in order to use the Dexsil method. As a result of this discussion, Kim and I were both under the impression that you were not going to use field screening and therefore, fixed lab analysis would be required for both waste segregation and for determining if a PCB cleanup standard had been achieved.

Also, in addition to the original request for 2 clean hard copies of the final plan as well as an electronic version, we would like a red-lined strike-out version of the text, updated figures and a document that responds to EPAs comment as well. Call me if you have any further questions and thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, January 19, 2018 4:40 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Battaglia, Frank <battaglia.frank@epa.gov>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Before we can re-issue the CMI we need to resolve the PCB comparability study issue for the use of Dexsil PCB field screening on this site. Also, do you still want to get a red-lined strike-out version of the CMI text? Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531
www.aeiconsultants.com

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Friday, January 19, 2018 3:06 PM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Rick Kowalski <rkowalski@aeiconsultants.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank, BASF agrees w your assessment, and we will include this email instruction into our CMI.
Regards.

Joe Guarnaccia
732 762 4743

From: Battaglia, Frank
Sent: 1/18/2018 6:16 PM
To: Rick Kowalski; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham; Battaglia, Frank
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, after reviewing the additional information provided and discussing your request with Kim and the RIDEM, we decided that rolls of plastic orange snow fence are not an appropriate witness barrier given that this clean-up will be implemented under a risk based PCB clean-up approval. The cost savings of approximately $18,000.00 does not outweigh the advantages of the longer term protection provided by a continuous permeable geotextile material and a 2 foot clean soil cover in areas where the remaining PCB soil contamination is greater than 1 mg/kg and 10 mg/kg. The use of the permeable geotextile material factored into EPAs decision to move forward down the risk based approval path while not requiring BASF to submit a formal risk assessment since it would provide added protection given that the site would be open to public access. The only area where this geotextile material will not be necessary when PCB soil contamination is above 1 mg/kg is in the 20 foot wide sewer easement area, as we agreed to previously.

Please revise the plan to address all of EPAs comments over the last 2 months and resubmit it to EPA. We will need 2 hard copies of the final plan as well as an electronic version. I believe that the RIDEM will also need a hard copy and an electronic copy for their files. Thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Rick Kowalski [rkowalski@aeiconsultants.com]
Sent: Wednesday, January 17, 2018 9:33 AM
To: Battaglia, Frank; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL]: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF is in agreement with your changes. However, we would like to ask if we could use rolls of plastic orange snow fence as the witness barrier in the areas where PCBs are >1 and <10 ppm, instead of the geotextile specified for areas >10 ppm PCBs. The snow fencing is much cheaper and easier to install. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants

112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
www.aeiconsultants.com<http://www.aeiconsultants.com/>

From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 11, 2018 6:07 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick: we agree with your changes in blue and I have added them as well as the changes I discussed with you the other day. They are in yellow italics and include some additional language for consistency/clarity, I hope. I also reviewed the document several times and believe it should cover all the scenarios we discussed over the last couple of months.

Let us know if this is OK or if you find any significant inconsistencies. Once we agree on this language, we can omit the color and strikeouts and resend. Hopefully it will read clearly.

Thanks for your patience.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, December 22, 2017 11:00 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: I just realized the last sentence of the summary needs a slight modification since the liner will be installed after backfilling the excavations. The new sentence reads:

Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner as described in bullets 5 and 6, cover with clean soil and bring to grade as appropriate, based on remaining PCB soil concentrations.

Let us know if this is acceptable. Thanks

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Rick Kowalski

Sent: Friday, December 22, 2017 9:11 AM
To: 'Battaglia, Frank' <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: We made one last minor change in regard to the liner. See text added in blue font below. Thanks,

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB and install cover materials(s) defined as permeable geotextile and impermeable HDPE, as appropriate, liner as described in bullets 5 and 6, Line, cover with 2 ft clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table and fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB. Install cover material(s) liner as described in bullets 5 and 6, Line, c cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with remaining soil containing PCB >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner cover material. The areas which are anticipated to require the HDPE liner cover material are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner cover materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot clean soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile material (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB >1 mg/kg will be covered with a permeable witness layer and with by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E). The permeable witness layer need not be installed in the 20 foot wide sewer easement area which is parallel to the warehouse building on the northern side of lot 1102 but this sewer easement area needs to be addressed in the soil management plan as part of the environmental land usage restriction.
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction which includes a soil management plan as required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft clean soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable cover material liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE cover material. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE cover material liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE cover material liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable cover material liner installed within the Floodway and the amount of impermeable cover material liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with cover material and 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner cover material (s) as described in bullets 5 and 6, Line, fill excavation and cover with clean soil as explained in bullet #10 7 and bring to grade as appropriate, all based on the remaining PCB soil concentrations.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 21, 2017 2:19 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, Kelly and others,

I agree with Joe's language highlighted in green and I added the red text for additional clarity in areas where an excavation needs to be filled and the 2 ft soil cover specifications in bullet #7. I did not include an attachment.

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB >1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.
10. In all areas on-site, the 2 ft soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete

slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - Line, fill excavation and cover with clean soil as explained in bullet #10 and bring to grade as appropriate, based on remaining PCB soil concentrations.

Hope this is OK.

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, December 19, 2017 4:24 PM
To: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank and Kelly,
The attachment Rick just sent (attached here) is the summary with Frank's original edits accepted, and we added the GREEN text for clarity.

Joe.
EHS Remediation Specialist

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Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 19, 2017 2:28 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Ok, thanks Kelly.

Frank: I have attached a revised version of the soil remedy summary which includes a change to the last paragraph, if you would prefer to retain that. Please let me know if this is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 3:00 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Those were Frank's additions. I will let him weigh in on those issues.

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 1:49 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

We would prefer to omit the three "summary" sentences from this to avoid confusion, instead of adding "where necessary." All other changes will be incorporated into the revised CMI, assuming my other edit is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 1:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

I just want to remind you that the leachability standard is 10 ppm, so if the remaining concentration of PCBs is >= 10 ppm and <= 25 ppm, the area needs to be covered by a concrete slab or an impermeable liner. That seems to be what you originally stated in #5, so I'm not sure why the "where necessary" is needed.

Kelly

Kelly J. Owens
Associate Supervising Engineer
RIDEM - Office of Waste Management
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Providence, RI 02908-5767
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kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:26 AM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

"Where necessary" refers to those areas where there are no concrete slabs present and there are >=10 ppm and <=25 ppm PCBs present, as stated in item #5.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 11:20 AM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Should we assume that "(where necessary)," refers to areas where there are foundations?

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]

Sent: Monday, December 18, 2017 11:10 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Your changes to the summary below are ok with the exception of the following part: "... and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable."

Technically we can't comply with RIDEM wetlands requirements and install a 2 foot cap. Therefore, we will be seeking approval for a variance to the regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot cap will not result in a significant change in the local flood elevations.

In addition, we would add the following (in green) to your final summary sentence: Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner (where necessary), a permeable liner and 2 ft clean soil.

Please let us know if you have any questions. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is

presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements for unrestricted use (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner and permeable liner and 2 ft clean soil. Let me know if this accurately reflects all our concerns. Thanks.

Frank Battaglia
617 918-1362

Tisa, Kimberly

From: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>
Sent: Saturday, January 20, 2018 10:11 AM
To: Battaglia, Frank; Rick Kowalski; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF agrees with your assessment, and we will update the CMI to reflect all of our agreed-upon changes.
Regards
Joe

Joseph Guarnaccia Ph. D.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail: joseph.guarnaccia@basf.com Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

-----Original Message-----
From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 18, 2018 5:15 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, after reviewing the additional information provided and discussing your request with Kim and the RIDEM, we decided that rolls of plastic orange snow fence are not an appropriate witness barrier given that this clean-up will be implemented under a risk based PCB clean-up approval. The cost savings of approximately $18,000.00 does not outweigh the advantages of the longer term protection provided by a continuous permeable geotextile material and a 2 foot clean soil cover in areas where the remaining PCB soil contamination is greater than 1 mg/kg and 10 mg/kg. The use of the permeable geotextile material factored into EPAs decision to move forward down the risk based approval path while not requiring BASF to submit a formal risk assessment since it would provide added protection given that the site would be open to public access. The only area where this geotextile material will not be necessary when PCB soil contamination is above 1 mg/kg is in the 20 foot wide sewer easement area, as we agreed to previously.

Please revise the plan to address all of EPAs comments over the last 2 months and resubmit it to EPA. We will need 2 hard copies of the final plan as well as an electronic version. I believe that the RIDEM will also need a hard copy and an electronic copy for their files. Thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Rick Kowalski [rkowalski@aeiconsultants.com]
Sent: Wednesday, January 17, 2018 9:33 AM

To: Battaglia, Frank; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF is in agreement with your changes. However, we would like to ask if we could use rolls of plastic orange snow fence as the witness barrier in the areas where PCBs are >1 and <10 ppm, instead of the geotextile specified for areas >10 ppm PCBs. The snow fencing is much cheaper and easier to install. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
www.aeiconsultants.com<http://www.aeiconsultants.com/>

From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 11, 2018 6:07 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick: we agree with your changes in blue and I have added them as well as the changes I discussed with you the other day. They are in yellow italics and include some additional language for consistency/clarity, I hope. I also reviewed the document several times and believe it should cover all the scenarios we discussed over the last couple of months.

Let us know if this is OK or if you find any significant inconsistencies. Once we agree on this language, we can omit the color and strikeouts and resend. Hopefully it will read clearly.

Thanks for your patience.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, December 22, 2017 11:00 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: I just realized the last sentence of the summary needs a slight modification since the liner will be installed after backfilling the excavations. The new sentence reads:

Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner as described in bullets 5 and 6, cover with clean soil and bring to grade as appropriate, based on remaining PCB soil concentrations.

Let us know if this is acceptable. Thanks

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
112 Water Street, 5th Floor
Boston, MA 02109

c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
www.aeiconsultants.com<http://www.aeiconsultants.com/>

From: Rick Kowalski
Sent: Friday, December 22, 2017 9:11 AM
To: 'Battaglia, Frank' <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: We made one last minor change in regard to the liner. See text added in blue font below. Thanks,

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB and install cover materials(s) defined as permeable geotextile and impermeable HDPE, as appropriate, liner as described in bullets 5 and 6, Line, cover with 2 ft clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table and fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB. Install cover material(s) liner as described in bullets 5 and 6, Line, c cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with remaining soil containing PCB >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner cover material. The areas which are anticipated to require the HDPE liner cover material are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner cover materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the

installation of the 2 foot clean soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.

6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile material (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.

7. All areas with PCB >1 mg/kg will be covered with a permeable witness layer and with by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E). The permeable witness layer need not be installed in the 20 foot wide sewer easement area which is parallel to the warehouse building on the northern side of lot 1102 but this sewer easement area needs to be addressed in the soil management plan as part of the environmental land usage restriction.

8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction which includes a soil management plan as required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft clean soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable cover material liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE cover material. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE cover material liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE cover material liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable cover material liner installed within the Floodway and the amount of impermeable cover material liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with cover material and 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner cover material (s) as described in bullets 5 and 6, Line, fill excavation and cover with clean soil as explained in bullet #10 7 and bring to grade as appropriate, all based on the remaining PCB soil concentrations.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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Boston, MA 02109

c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 21, 2017 2:19 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, Kelly and others,

I agree with Joe's language highlighted in green and I added the red text for additional clarity in areas where an excavation needs to be filled and the 2 ft soil cover specifications in bullet #7. I did not include an attachment.

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25

mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.

7. All areas with PCB >1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E).

8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - Line, fill excavation and cover with clean soil as explained in bullet #10 and bring to grade as appropriate, based on remaining PCB soil concentrations.

Hope this is OK.

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, December 19, 2017 4:24 PM
To: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank and Kelly,
The attachment Rick just sent (attached here) is the summary with Frank's original edits accepted, and we added the GREEN text for clarity.

Joe.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail:
joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 19, 2017 2:28 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Ok, thanks Kelly.

Frank: I have attached a revised version of the soil remedy summary which includes a change to the last paragraph, if you would prefer to retain that. Please let me know if this is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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Boston, MA 02109

c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
www.aeiconsultants.com<http://www.aeiconsultants.com/>

From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 3:00 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Those were Frank's additions. I will let him weigh in on those issues.

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 1:49 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

We would prefer to omit the three "summary" sentences from this to avoid confusion, instead of adding "where necessary." All other changes will be incorporated into the revised CMI, assuming my other edit is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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112 Water Street, 5th Floor
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c. 508.951.3673
f. 857.233.5531<tel:408.559.7601>
www.aeiconsultants.com<http://www.aeiconsultants.com/>

From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 1:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

I just want to remind you that the leachability standard is 10 ppm, so if the remaining concentration of PCBs is >= 10 ppm and <= 25 ppm, the area needs to be covered by a concrete slab or an impermeable liner. That seems to be what you originally stated in #5, so I'm not sure why the "where necessary" is needed.

Kelly

Kelly J. Owens
Associate Supervising Engineer
RIDEM - Office of Waste Management
235 Promenade Street
Providence, RI 02908-5767
Telephone: (401) 222-2797 Ext. 7108

Fax: (401) 222-3813
kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:26 AM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

"Where necessary" refers to those areas where there are no concrete slabs present and there are >=10 ppm and <=25 ppm PCBs present, as stated in item #5.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 11:20 AM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Should we assume that "(where necessary)," refers to areas where there are foundations?

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:10 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>

Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Your changes to the summary below are ok with the exception of the following part: "... and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable."

Technically we can't comply with RIDEM wetlands requirements and install a 2 foot cap. Therefore, we will be seeking approval for a variance to the regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot cap will not result in a significant change in the local flood elevations.

In addition, we would add the following (in green) to your final summary sentence: Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner (where necessary), a permeable liner and 2 ft clean soil.

Please let us know if you have any questions. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements for unrestricted use (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner and permeable liner and 2 ft clean soil. Let me know if this accurately reflects all our concerns. Thanks.

Frank Battaglia
617 918-1362

Tisa, Kimberly

From: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>
Sent: Saturday, January 20, 2018 10:11 AM
To: Battaglia, Frank; Rick Kowalski; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF agrees with your assessment, and we will update the CMI to reflect all of our agreed-upon changes.
Regards
Joe

Joseph Guarnaccia Ph. D.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail: joseph.guarnaccia@basf.com Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

-----Original Message-----
From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 18, 2018 5:15 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, after reviewing the additional information provided and discussing your request with Kim and the RIDEM, we decided that rolls of plastic orange snow fence are not an appropriate witness barrier given that this clean-up will be implemented under a risk based PCB clean-up approval. The cost savings of approximately $18,000.00 does not outweigh the advantages of the longer term protection provided by a continuous permeable geotextile material and a 2 foot clean soil cover in areas where the remaining PCB soil contamination is greater than 1 mg/kg and 10 mg/kg. The use of the permeable geotextile material factored into EPAs decision to move forward down the risk based approval path while not requiring BASF to submit a formal risk assessment since it would provide added protection given that the site would be open to public access. The only area where this geotextile material will not be necessary when PCB soil contamination is above 1 mg/kg is in the 20 foot wide sewer easement area, as we agreed to previously.

Please revise the plan to address all of EPAs comments over the last 2 months and resubmit it to EPA. We will need 2 hard copies of the final plan as well as an electronic version. I believe that the RIDEM will also need a hard copy and an electronic copy for their files. Thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Rick Kowalski [rkowalski@aeiconsultants.com]
Sent: Wednesday, January 17, 2018 9:33 AM

To: Battaglia, Frank; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF is in agreement with your changes. However, we would like to ask if we could use rolls of plastic orange snow fence as the witness barrier in the areas where PCBs are >1 and <10 ppm, instead of the geotextile specified for areas >10 ppm PCBs. The snow fencing is much cheaper and easier to install. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 11, 2018 6:07 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick: we agree with your changes in blue and I have added them as well as the changes I discussed with you the other day. They are in yellow italics and include some additional language for consistency/clarity, I hope. I also reviewed the document several times and believe it should cover all the scenarios we discussed over the last couple of months.

Let us know if this is OK or if you find any significant inconsistencies. Once we agree on this language, we can omit the color and strikeouts and resend. Hopefully it will read clearly.

Thanks for your patience.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, December 22, 2017 11:00 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: I just realized the last sentence of the summary needs a slight modification since the liner will be installed after backfilling the excavations. The new sentence reads:

Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner as described in bullets 5 and 6, cover with clean soil and bring to grade as appropriate, based on remaining PCB soil concentrations.

Let us know if this is acceptable. Thanks

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Rick Kowalski
Sent: Friday, December 22, 2017 9:11 AM
To: 'Battaglia, Frank' <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: We made one last minor change in regard to the liner. See text added in blue font below. Thanks,

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB and install cover materials(s) defined as permeable geotextile and impermeable HDPE, as appropriate, liner as described in bullets 5 and 6, Line, cover with 2 ft clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table and fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB. Install cover material(s) liner as described in bullets 5 and 6, Line, c cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with remaining soil containing PCB >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner cover material. The areas which are anticipated to require the HDPE liner cover material are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner cover materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the

installation of the 2 foot clean soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.

6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile material (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.

7. All areas with PCB >1 mg/kg will be covered with a permeable witness layer and with by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E). The permeable witness layer need not be installed in the 20 foot wide sewer easement area which is parallel to the warehouse building on the northern side of lot 1102 but this sewer easement area needs to be addressed in the soil management plan as part of the environmental land usage restriction.

8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction which includes a soil management plan as required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft clean soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable cover material liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE cover material. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE cover material liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE cover material liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable cover material liner installed within the Floodway and the amount of impermeable cover material liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with cover material and 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner cover material (s) as described in bullets 5 and 6, Line, fill excavation and cover with clean soil as explained in bullet #10 7 and bring to grade as appropriate, all based on the remaining PCB soil concentrations.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 21, 2017 2:19 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, Kelly and others,

I agree with Joe's language highlighted in green and I added the red text for additional clarity in areas where an excavation needs to be filled and the 2 ft soil cover specifications in bullet #7. I did not include an attachment.

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25

mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.

7. All areas with PCB >1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E).

8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations; as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - Line, fill excavation and cover with clean soil as explained in bullet #10 and bring to grade as appropriate, based on remaining PCB soil concentrations.

Hope this is OK.

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, December 19, 2017 4:24 PM
To: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank and Kelly,
The attachment Rick just sent (attached here) is the summary with Frank's original edits accepted, and we added the GREEN text for clarity.

Joe.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail:
joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 19, 2017 2:28 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Ok, thanks Kelly.

Frank: I have attached a revised version of the soil remedy summary which includes a change to the last paragraph, if you would prefer to retain that. Please let me know if this is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 3:00 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Those were Frank's additions. I will let him weigh in on those issues.

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 1:49 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

We would prefer to omit the three "summary" sentences from this to avoid confusion, instead of adding "where necessary." All other changes will be incorporated into the revised CMI, assuming my other edit is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 1:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

I just want to remind you that the leachability standard is 10 ppm, so if the remaining concentration of PCBs is >= 10 ppm and <= 25 ppm, the area needs to be covered by a concrete slab or an impermeable liner. That seems to be what you originally stated in #5, so I'm not sure why the "where necessary" is needed.

Kelly

Kelly J. Owens
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kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:26 AM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

"Where necessary" refers to those areas where there are no concrete slabs present and there are >=10 ppm and <=25 ppm PCBs present, as stated in item #5.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 11:20 AM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Should we assume that "(where necessary)," refers to areas where there are foundations?

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:10 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>

Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Your changes to the summary below are ok with the exception of the following part: "... and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable."

Technically we can't comply with RIDEM wetlands requirements and install a 2 foot cap. Therefore, we will be seeking approval for a variance to the regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot cap will not result in a significant change in the local flood elevations.

In addition, we would add the following (in green) to your final summary sentence: Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner (where necessary), a permeable liner and 2 ft clean soil.

Please let us know if you have any questions. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements for unrestricted use (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner and permeable liner and 2 ft clean soil. Let me know if this accurately reflects all our concerns. Thanks.

Frank Battaglia
617 918-1362

Tisa, Kimberly

From: Rick Kowalski <rkowalski@aeiconsultants.com>
Sent: Friday, January 19, 2018 4:40 PM
To: Joseph F Guarnaccia; Battaglia, Frank; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Before we can re-issue the CMI we need to resolve the PCB comparability study issue for the use of Dexsil PCB field screening on this site. Also, do you still want to get a red-lined strike-out version of the CMI text? Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Friday, January 19, 2018 3:06 PM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Rick Kowalski <rkowalski@aeiconsultants.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Stephen Graham <sgraham@aeiconsultants.com>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank, BASF agrees w your assessment, and we will include this email instruction into our CMI.
Regards.

Joe Guarnaccia
732 762 4743

From: Battaglia, Frank
Sent: 1/18/2018 6:16 PM
To: Rick Kowalski; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham; Battaglia, Frank
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, after reviewing the additional information provided and discussing your request with Kim and the RIDEM, we decided that rolls of plastic orange snow fence are not an appropriate witness barrier given that this clean-up will be implemented under a risk based PCB clean-up approval. The cost savings of approximately $18,000.00 does not outweigh the advantages of the longer term protection provided by a continuous permeable geotextile material and a 2 foot clean soil cover in areas where the remaining PCB soil contamination is greater than 1 mg/kg and 10 mg/kg. The use of the permeable geotextile material factored into EPAs decision to move forward down the risk based approval path while not requiring BASF to submit a formal risk assessment since it would provide added protection given that the site would be open to public access. The only area where this geotextile material will not be necessary when PCB soil contamination is above 1 mg/kg is in the 20 foot wide sewer easement area, as we agreed to previously.

Please revise the plan to address all of EPAs comments over the last 2 months and resubmit it to EPA. We will need 2 hard copies of the final plan as well as an electronic version. I believe that the RIDEM will also need a hard copy and an electronic copy for their files. Thanks for your continued cooperation.

Sincerely,

Frank Battaglia
617 918-1362

From: Rick Kowalski [rkowalski@aeiconsultants.com]
Sent: Wednesday, January 17, 2018 9:33 AM
To: Battaglia, Frank; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Stephen Graham
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

BASF is in agreement with your changes. However, we would like to ask if we could use rolls of plastic orange snow fence as the witness barrier in the areas where PCBs are >1 and <10 ppm, instead of the geotextile specified for areas >10 ppm PCBs. The snow fencing is much cheaper and easier to install. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, January 11, 2018 6:07 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick: we agree with your changes in blue and I have added them as well as the changes I discussed with you the other day. They are in yellow italics and include some additional language for consistency/clarity, I hope. I also reviewed the document several times and believe it should cover all the scenarios we discussed over the last couple of months.

Let us know if this is OK or if you find any significant inconsistencies. Once we agree on this language, we can omit the color and strikeouts and resend. Hopefully it will read clearly.

Thanks for your patience.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, December 22, 2017 11:00 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov

<kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: I just realized the last sentence of the summary needs a slight modification since the liner will be installed after backfilling the excavations. The new sentence reads:

Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner as described in bullets 5 and 6, cover with clean soil and bring to grade as appropriate, based on remaining PCB soil concentrations.

Let us know if this is acceptable. Thanks

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Rick Kowalski
Sent: Friday, December 22, 2017 9:11 AM
To: 'Battaglia, Frank' <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: We made one last minor change in regard to the liner. See text added in blue font below. Thanks,

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB and install cover materials(s) defined as permeable geotextile and impermeable HDPE, as appropriate, liner as described in bullets 5 and 6, Line, cover with 2 ft clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table and fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB. Install cover material(s) liner as described in bullets 5 and 6, Line, c cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with remaining soil containing PCB >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner cover material. The areas which are anticipated to require the HDPE liner cover material are shown on Contract Drawing C-6 (attached). The 2 ft clean

soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner cover materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot clean soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.

6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile material (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.

7. All areas with PCB >1 mg/kg will be covered with a permeable witness layer and with by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E). The permeable witness layer need not be installed in the 20 foot wide sewer easement area which is parallel to the warehouse building on the northern side of lot 1102 but this sewer easement area needs to be addressed in the soil management plan as part of the environmental land usage restriction.

8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction which includes a soil management plan as required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft clean soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable cover material liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE cover material. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE cover material liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE cover material liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable cover material liner installed within the Floodway and the amount of impermeable cover material liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with cover material and 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - fill excavations as explained in bullet #10, install liner cover material (s) as described in bullets 5 and 6, Line, fill excavation and cover with clean soil as explained in bullet #10 7 and bring to grade as appropriate, all based on the remaining PCB soil concentrations.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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f. 857.233.5531<tel:408.559.7601>
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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 21, 2017 2:19 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, Kelly and others,

I agree with Joe's language highlighted in green and I added the red text for additional clarity in areas where an excavation needs to be filled and the 2 ft soil cover specifications in bullet #7. I did not include an attachment.

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced defined in item #7 below will also cover all permeable and impermeable liner materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot soil cap cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB >1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a

minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

10. In all areas on-site, the 2 ft soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg - Line, fill excavation and cover with clean soil as explained in bullet #10 and bring to grade as appropriate, based on remaining PCB soil concentrations.

Hope this is OK.

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, December 19, 2017 4:24 PM
To: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>; Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank and Kelly,
The attachment Rick just sent (attached here) is the summary with Frank's original edits accepted, and we added the GREEN text for clarity.

Joe.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail:
joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]

Sent: Tuesday, December 19, 2017 2:28 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Ok, thanks Kelly.

Frank: I have attached a revised version of the soil remedy summary which includes a change to the last paragraph, if you would prefer to retain that. Please let me know if this is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 3:00 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Those were Frank's additions. I will let him weigh in on those issues.

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 1:49 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

We would prefer to omit the three "summary" sentences from this to avoid confusion, instead of adding "where necessary." All other changes will be incorporated into the revised CMI, assuming my other edit is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 1:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

I just want to remind you that the leachability standard is 10 ppm, so if the remaining concentration of PCBs is >= 10 ppm and <= 25 ppm, the area needs to be covered by a concrete slab or an impermeable liner. That seems to be what you originally stated in #5, so I'm not sure why the "where necessary" is needed.

Kelly

Kelly J. Owens
Associate Supervising Engineer
RIDEM - Office of Waste Management
235 Promenade Street
Providence, RI 02908-5767
Telephone: (401) 222-2797 Ext. 7108
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kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:26 AM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

"Where necessary" refers to those areas where there are no concrete slabs present and there are >=10 ppm and <=25 ppm PCBs present, as stated in item #5.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 11:20 AM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Should we assume that "(where necessary)," refers to areas where there are foundations?

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:10 AM
To: Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>; Owens, Kelly (DEM) <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>
Subject: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Your changes to the summary below are ok with the exception of the following part: "... and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable."

Technically we can't comply with RIDEM wetlands requirements and install a 2 foot cap. Therefore, we will be seeking approval for a variance to the regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot cap will not result in a significant change in the local flood elevations.

In addition, we would add the following (in green) to your final summary sentence: Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner (where necessary), a permeable liner and 2 ft clean soil.

Please let us know if you have any questions. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com<mailto:rkowalski@aeiconsultants.com>>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov<mailto:kelly.owens@dem.ri.gov>>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov<mailto:jeff.crawford@dem.ri.gov>>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com<mailto:joseph.guarnaccia@basf.com>>; Stephen Graham <sgraham@aeiconsultants.com<mailto:sgraham@aeiconsultants.com>>; Tisa, Kimberly <Tisa.Kimberly@epa.gov<mailto:Tisa.Kimberly@epa.gov>>; Battaglia, Frank <battaglia.frank@epa.gov<mailto:battaglia.frank@epa.gov>>
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on Contract Drawing C-6 (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements for unrestricted use (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications (Appendix E).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation

landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on Contract Drawing C-6. As shown on Contract Drawing C-6, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain - cover with clean soil. Where PCBs >= 1mg/kg and <10 mg/kg remain - cover with 2 ft clean soil. Where PCBs >=10 mg/kg and <=25 mg/kg remain - addition of an impermeable liner and permeable liner and 2 ft clean soil. Let me know if this accurately reflects all our concerns. Thanks.

Frank Battaglia
617 918-1362

Tisa, Kimberly

From: Battaglia, Frank
Sent: Thursday, January 11, 2018 6:07 PM
To: Rick Kowalski; Joseph F Guarnaccia; kelly.owens.dem.ri.gov
Cc: Tisa, Kimberly; Crawford, Jeffrey (DEM); Battaglia, Frank
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick: we agree with your changes in blue and I have added them as well as the changes I discussed with you the other day. They are in yellow italics and include some additional language for consistency/clarity, I hope. I also reviewed the document several times and believe it should cover all the scenarios we discussed over the last couple of months.

Let us know if this is OK or if you find any significant inconsistencies. Once we agree on this language, we can omit the color and strikeouts and resend. Hopefully it will read clearly.

Thanks for your patience.

Frank Battaglia
617 918-1362

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Friday, December 22, 2017 11:00 AM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) jeff.crawford@dem.ri.gov
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: I just realized the last sentence of the summary needs a slight modification since the liner will be installed after backfilling the excavations. The new sentence reads:

Remove soils with PCBs >25 mg/kg – fill excavations as explained in bullet #10, install liner as described in bullets 5 and 6, cover with clean soil and bring to grade as appropriate, based on remaining PCB soil concentrations.

Let us know if this is acceptable. Thanks

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Rick Kowalski
Sent: Friday, December 22, 2017 9:11 AM

To: 'Battaglia, Frank' <battaglia.frank@epa.gov>; Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: We made one last minor change in regard to the liner. See text added in blue font below. Thanks,

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. *Fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB and* install *cover materials(s) defined as permeable geotextile and impermeable HDPE,* as appropriate, ~~liner~~ as described in bullets 5 and 6, ~~Line,~~ cover with *2 ft* clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table *and fill excavation with soils stockpiled on-site that contain <10 mg/kg PCB*. Install *cover material(s)* ~~liner~~ as described in bullets 5 and 6, ~~Line, c~~ cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with *remaining* soil containing PCB >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE ~~liner~~ *cover* material. The areas which are anticipated to require the HDPE ~~liner~~ *cover material* are shown on **Contract Drawing C-6** (attached). The 2 ft clean soil cover ~~referenced~~ defined in item #7 below will also cover all permeable and impermeable ~~liner~~ *cover* materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot *clean* soil ~~cap~~ cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile *material* (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ~~ppm~~ mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB >1 mg/kg will be covered *with a permeable witness layer and with* ~~by~~ a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications **(Appendix E)**. *The permeable witness layer need not be installed in the 20 foot wide sewer easement area which is parallel to the warehouse building on the northern side of lot 1102 but this sewer easement area needs to be addressed in the soil management plan as part of the environmental land usage restriction.*
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction *which includes a soil management plan* as required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.
10. In all areas on-site, the 2 ft clean soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable *cover material* ~~liner~~ to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE *cover material*. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE *cover material* ~~liner~~ if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE *cover material* ~~liner~~ (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on **Contract Drawing C-6**. As shown on **Contract Drawing C-6**, there will be no impermeable *cover material* ~~liner~~ installed within the Floodway and the amount of impermeable *cover material* ~~liner~~ within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain – cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain – cover with *cover material* and 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain – addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg – fill excavations as explained in bullet #10, install ~~liner~~ *cover material (s)* as described in bullets 5 and 6, ~~Line, fill excavation and~~ cover with clean soil as explained in bullet ~~#10~~ *7* and bring to grade as appropriate, *all* based on *the* remaining PCB soil concentrations.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 21, 2017 2:19 PM
To: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Rick Kowalski <rkowalski@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Joe, Kelly and others,

I agree with Joe's language highlighted in green and I added the red text for additional clarity in areas where an excavation needs to be filled and the 2 ft soil cover specifications in bullet #7. I did not include an attachment.

Soil Remedy Summary
Former Ciba-Geigy Facility
180 Mill Street, Cranston, Rhode Island

1. Remove soils with PCB concentrations >25 mg/kg. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace all excavated soil with clean soil as defined in bullet #7.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table. Line, cover with clean soil as defined in bullet #7, and bring to grade as appropriate, all based on the remaining PCB soil concentrations.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL target across the site is <10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on **Contract Drawing C-6** (attached). The 2 ft clean soil cover ~~referenced~~ defined in item #7 below will also cover all permeable and impermeable liner materials and BASF will seek approval for a variance to the RIDEM Wetlands regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot soil ~~cap~~ cover will not result in a significant change in the local flood elevations. If a variance is not approved by RIDEM Wetlands for the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ~~ppm~~ mg/kg and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB >1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements (the Residential Direct Exposure Criteria) & PCBs <1 mg/kg and in accordance with the Project Technical Specifications **(Appendix E**).
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.
10. In all areas on-site, the 2 ft soil cover will be defined as in bullet #7. For soils required to fill excavations that will be below the 2 ft soil cover in areas that are outside the FEMA Floodway, soils stockpiled on-site that contain PCBs <10 mg/kg may be used if included in the TSCA approval and specific soil data supports that the PCB concentrations are <10 mg/kg.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N

or equivalent) are shown on **Contract Drawing C-6**. As shown on **Contract Drawing C-6**, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain – cover with clean soil as defined in bullet #7. Where PCBs >= 1mg/kg and <10 mg/kg remain – cover with 2 ft clean soil and see bullet #10 for further guidance. Where PCBs >=10 mg/kg and <=25 mg/kg remain – addition of an impermeable liner, where there does not already exist an in-situ concrete slab, and permeable liner and 2 ft clean soil and see bullet #10 for further guidance. Remove soils with PCBs >25 mg/kg – Line, fill excavation and cover with clean soil as explained in bullet #10 and bring to grade as appropriate, based on remaining PCB soil concentrations.

Hope this is OK.

Frank Battaglia
617 918-1362

From: Joseph F Guarnaccia [mailto:joseph.guarnaccia@basf.com]
Sent: Tuesday, December 19, 2017 4:24 PM
To: kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Cc: Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>; Rick Kowalski <rkowalski@aeiconsultants.com>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank and Kelly,
The attachment Rick just sent (attached here) is the summary with Frank's original edits accepted, and we added the GREEN text for clarity.

Joe.
EHS Remediation Specialist

Phone: 973 245 5269 Mobile: 732 762 4743 E-Mail: joseph.guarnaccia@basf.com
Postal Address: BASF Corporation, 100 Park Ave, Florham Park, N.J. 07932 USA

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 19, 2017 2:28 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Ok, thanks Kelly.

Frank: I have attached a revised version of the soil remedy summary which includes a change to the last paragraph, if you would prefer to retain that. Please let me know if this is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

AEI Consultants
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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 3:00 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Those were Frank's additions. I will let him weigh in on those issues.

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 1:49 PM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

We would prefer to omit the three "summary" sentences from this to avoid confusion, instead of adding "where necessary." All other changes will be incorporated into the revised CMI, assuming my other edit is acceptable.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 1:36 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

I just want to remind you that the leachability standard is 10 ppm, so if the remaining concentration of PCBs is >= 10 ppm and <= 25 ppm, the area needs to be covered by a concrete slab or an impermeable liner. That seems to be what you originally stated in #5, so I'm not sure why the "where necessary" is needed.

Kelly

Kelly J. Owens
Associate Supervising Engineer
RIDEM - Office of Waste Management
235 Promenade Street
Providence, RI 02908-5767
Telephone: (401) 222-2797 Ext. 7108
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kelly.owens@dem.ri.gov

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:26 AM
To: Owens, Kelly (DEM) <kelly.owens@dem.ri.gov>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

"Where necessary" refers to those areas where there are no concrete slabs present and there are >=10 ppm and <=25 ppm PCBs present, as stated in item #5.

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Owens, Kelly (DEM) [mailto:kelly.owens@dem.ri.gov]
Sent: Monday, December 18, 2017 11:20 AM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; Battaglia, Frank <battaglia.frank@epa.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: RE: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick,

Should we assume that "(where necessary)," refers to areas where there are foundations?

Kelly

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Monday, December 18, 2017 11:10 AM
To: Battaglia, Frank <battaglia.frank@epa.gov>; Owens, Kelly (DEM) <kelly.owens@dem.ri.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>
Subject: [EXTERNAL] : RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Frank: Your changes to the summary below are ok with the exception of the following part: "... and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable."

Technically we can't comply with RIDEM wetlands requirements and install a 2 foot cap. Therefore, we will be seeking approval for a variance to the regulations through the filing of a Preliminary Determination of Applicability. This will include the results of the FEMA floodway modelling which has shown that the installation of the 2 foot cap will not result in a significant change in the local flood elevations.

In addition, we would add the following (in green) to your final summary sentence: Where PCBs >=10 mg/kg and <=25 mg/kg remain – addition of an impermeable liner (where necessary), a permeable liner and 2 ft clean soil.

Please let us know if you have any questions. Thanks,

Richard G. Kowalski, CPG, LSP, CHMM
Senior Hydrogeologist

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From: Battaglia, Frank [mailto:battaglia.frank@epa.gov]
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski <rkowalski@aeiconsultants.com>; kelly.owens.dem.ri.gov <kelly.owens@dem.ri.gov>; Crawford, Jeffrey (DEM) <jeff.crawford@dem.ri.gov>
Cc: Joseph F Guarnaccia <joseph.guarnaccia@basf.com>; Stephen Graham <sgraham@aeiconsultants.com>; Tisa, Kimberly <Tisa.Kimberly@epa.gov>; Battaglia, Frank <battaglia.frank@epa.gov>
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on **Contract Drawing C-6** (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements ~~for unrestricted use~~ (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications **(Appendix E)**.
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition, at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).
9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

Specific to the 10 mg/kg metric: For all areas defined with PCBs >25 mg/kg, the goal will be to achieve <10 mg/kg at the extent of these excavations, as possible, in order to minimize the use of impermeable liner to address leachability issues. Excavations will not extend below the water table (except for the TP-5 area) and may be halted if subsurface obstructions are encountered. If the <10 mg/kg goal is not achieved in an area designated for excavation, that area will be covered with an impermeable HDPE liner. Areas with PCBs <=25 mg/kg, but >=10 mg/kg will be covered with an impermeable HDPE liner if there is no concrete slab present to prevent leaching into groundwater. The areas which are anticipated to require the HDPE liner (Nilex 40 mil HDPE, or equivalent) and/or the geotextile (Mirafi 180N or equivalent) are shown on **Contract Drawing C-6**. As shown on **Contract Drawing C-6**, there will be no impermeable liner installed within the Floodway and the amount of impermeable liner within Zone AE has been minimized such that there will be no reduction in infiltration which will be documented in the Floodway modelling to be submitted with the Wetlands Preliminary Determination Application.

In summary, where PCBs < 1mg/kg remain – cover with clean soil. Where PCBs >= 1mg/kg and <10 mg/kg remain – cover with 2 ft clean soil. Where PCBs >=10 mg/kg and <=25 mg/kg remain – addition of an impermeable liner and permeable liner and 2 ft clean soil. Let me know if this accurately reflects all our concerns. Thanks.

Frank Battaglia
617 918-1362

Tisa, Kimberly

From: Battaglia, Frank
Sent: Thursday, December 14, 2017 12:45 PM
To: Rick Kowalski; kelly.owens.dem.ri.gov; Crawford, Jeffrey (DEM)
Cc: Joseph F Guarnaccia; Stephen Graham; Tisa, Kimberly; Battaglia, Frank
Subject: RE: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Rick, Joe and others:

As a follow up to the EPA/BASF conference call on Monday 12/11/17 and the various discussions and e-mails with Kelly Owens and Kim Tisa regarding the summary of the revised remedial plan submitted by Rick Kowalski and highlighted below in yellow, I offer the following clarifications and additions highlighted in red.

From: Rick Kowalski [mailto:rkowalski@aeiconsultants.com]
Sent: Tuesday, December 12, 2017 5:38 PM
Subject: Former Ciba-Geigy, 180 Mill St, Cranston, RI

Kelly and Jeff: As a follow-up to a conference call completed with EPA yesterday, and at EPA's request, BASF is presenting this summary of the revised remedial action plan for soil at the above referenced Site to confirm that it is acceptable to both the EPA and RIDEM. This revised plan is based on the results of our joint call with EPA and RIDEM on November 3, 2017. The following is a summary of the components of the remedial action approach for soil with additional details below:

1. Remove soils with PCB concentrations >25 mg/kg.
2. In the FEMA Floodway, removal of soils with PCB concentrations >=1 mg/kg. Replace with clean soil.
3. Remove soils containing elevated VOCs in the SWMU-11 area to the groundwater table.
4. Remove additional soils as necessary with PCB concentrations >=10 mg/kg such that the 95% UCL is < 10 mg/kg.
5. To ensure PCB leaching potential is minimized, areas with >=10 mg/kg and <=25 mg/kg will be covered with an impermeable material, either in-situ concrete where the soils are sequestered below such infrastructure, or cover the surface area with an impermeable HDPE liner material. The areas which are anticipated to require the HDPE liner are shown on **Contract Drawing C-6** (attached). The 2 ft clean soil cover referenced in item #7 will also cover all permeable and impermeable liner materials and will comply with the RIDEM wetlands requirements for grade and drainage and all other requirements as practicable. Where wetlands requirements are in direct contrast to the agreed upon soil and membrane cover requirements, EPA will be notified and a compromise will need to be entered into by all parties.
6. All areas with PCB >=10 mg/kg and <=25 mg/kg remaining will ALSO be covered by a uniform permeable geotextile (extended beyond the outermost 10 mg/kg contour) to function as an impediment to unauthorized invasive activity and as a witness layer as part of the whole site cover. The permeable geotextile will cover all areas including those that need the impermeable liner and those that have concrete slabs in place over soils >10 ppm and <=25 mg/kg. This is because it's easier to cover everything from a practical installation perspective per Rick's follow up e-mail.
7. All areas with PCB > 1 mg/kg will be covered by a uniform clean 2 ft soil cover extended beyond the outermost 1 mg/kg contour and tested to meet the applicable RIDEM requirements ~~for unrestricted use~~ (the Residential Direct Exposure Criteria) and in accordance with the Project Technical Specifications **(Appendix E)**.
8. The remedial plan described above is intended to meet both TSCA and RIDEM Remedial Regulations, function as an impediment to unauthorized invasive activity and limit impact to groundwater considerations. In addition,

at a minimum, the lined cap/soil cover will provide a substrate to support an enhanced upland habitat vegetation landscaping scheme, and potentially to allow for RIDEM-approved public uses (e.g., open space park).

9. A PCB deed notice, required for any area where PCBs remain at >=1 mg/kg, and an environmental land usage restriction required by the RIDEM, will be entered into as a joint document, if possible, and will be recorded on the deed as required by the EPA TSCA program and the RIDEM.

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Frank Battaglia
617 918-1362